World Reference
in Waterproofing

Icopal Universal®

User Guide and Installation Procedures

Content

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Flexible & light
Reliable
Safe to use
Sustainable
Wide applications

Icopal Universal®

Icopal Universal® consists of a POCB (polyolefine copolymerisate binder) reinforced with polyester and glass fibre. The result is a strong, flexible, and extremely stable single layer roof covering that is UV resistant and tough.

Icopal Universal® is 3.2mm thick, lightweight and ideal for detailed roofing features, whilst also requiring a minimum of raw materials in manufacture.

Icopal Universal® can be applied rapidly to insulation materials, timber, concrete or profiled metal roofs, or as an overlay to existing bituminous roofing systems.

The three variations of Icopal Universal® meet a wide range of applications:

- Icopal Universal® - can be mechanically fixed, spray bonded, loose laid with ballast.
- Icopal Universal® SA - heat activated/self adhesive making detailing easy and safe.
- Icopal Universal® WS – resistant to root penetration making it ideal for green roof applications.

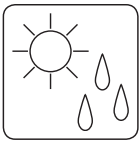
Safe to apply

As the application of Icopal Universal® requires no open flame, it's very safe to use, and on larger surfaces, overlaps can be permanently sealed using fully automatic, high speed welding equipment. Icopal Universal® SA is ideal for the flame-free sealing of details and can be attached to both Icopal Universal® and other bituminous roof materials.

Icopal Universal® is fully recyclable and together with the product's low mass, long life cycle, and manufacture from clean raw materials, it demonstrates a highly favourable Life Cycle Assessment, and meets the strictest standards for sustainable construction. Therefore, it can be used to reduce a building's environmental impact, making a significant contribution to any sustainable procurement policy.

In addition, Icopal Universal® SA is the ideal foundation for ICOSUN® Universal® flexible solar cells.

All the benefits at a **glance!**



Reliable, waterproof roof covering

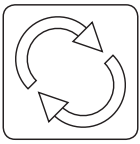
- Dimensionally stable
- Durable and strong
- Weather and UV resistant
- Homogeneous Overlaps

Responsible roof covering

- Can be applied without open flame
- Resistant to wind-spread fire
- Free of softening agents and chlorine
- Resistant to chemical attack

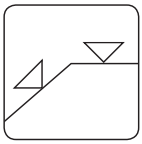
Cost-saving roof covering

- Single layer system
- Easy to fit
- Speedy application
- Low maintenance



Environmentally friendly roof covering

- Efficient production process
- Low-energy in use and application
- Fully recyclable
- Long life span



Universally applicable roof covering

- Several application methods
- Suitable for flat and pitched roofs
- Icopal Universal® WS is suitable as a root-penetration resistant layer
- Wide temperature application window

Guaranteed roof covering

- Option of fully-comprehensive project guarantee

Storage and equipment

Transport and Storage

The products are delivered in roll form stood on end on pallets and covered by a shrink wrap bag. Product must be transported and stored on end. If rolls are removed from original pallet they must be stored on end, upright on a firm flat surface. Do not store with rolls laid flat. Keep dry and out of direct exposure to the elements at temperatures of <30°C.

Rolls must be protected from mechanical damage and heat sources. If original packaging is removed, additional cover must be provided if product is to be stored outside. Do not store more than one pallet high. Icopal are not responsible for damage when the above instructions are not followed. If products are to be stored on the roof, care must be taken not to exceed the allowable live load of the structure.

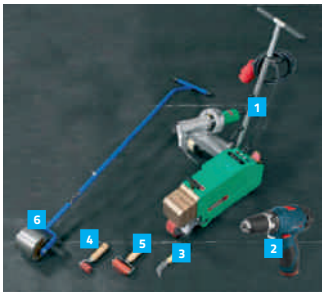
Store primers and adhesives in closed original containers in accordance with the instructions on the packaging or as detailed on the Health and Safety Data Sheet for each product. Take particular care with flammable materials.

Equipment

The following is intended as a basic guide to the required tools and equipment along with their operation necessary to install Icopal Universal®. Depending on the project, other tools and equipment may be required. Additionally, these instructions are provided as recommended guidelines to ensure proper performance of the equipment and successful installation of the Icopal Universal® membranes. Icopal does not endorse or recommend any particular brand of equipment.

Tools for main roof area & Insulation Fixing

1. Hot-air automatic welder
2. Fastening drill
3. Knife (hook & straight blades)
4. Silicone roller 40mm
5. Silicone Roller 80mm
6. Heavy steel lap roller



Hand tools for detail work

7. Hand held hot air welder
8. Silicone rubber roller 80mm
9. Silicone rubber roller 40mm
10. Brass "Penny" roller

Welding Equipment

There are several models available in both the hand held and automatic versions, and proper operating instruction in the use of each model is the responsibility of the manufacturer/supplier of the equipment. Always read and/or ask the manufacturer/supplier of the equipment for the correct and safe operating procedure.

Fastener Drills

Again many models are available and the correct equipment should be chosen to suit the type of fixing. Consideration should be given to the use of specialist drills with torque settings which can be set to avoid over tightening fixings, damaging membranes and/or reducing the performance of fixings.

Hand Rollers

80mm and 40mm silicone rubber rollers and brass penny rollers are used with hand held welders for secure overlap welding.

Health & Safety

All power supplies to electrical equipment should be as recommended by the manufacturer, with appropriate cabling, transformers and circuit breakers to protect operators and equipment. Health and Safety advice should be sought from the local Health and Safety Executive to ensure compliance with local regulations.

Product data

Icopal Universal® Membranes

	Icopal Universal®	Icopal Universal® SA	Icopal Universal® WS
Nominal Roll Length	10m	10m	10m
Nominal Roll Width	1m	1m	1m
Nominal Roll Weight	31.5kg	35kg	31.5kg
Nominal Thickness	3.2mm	3.5mm	3.2mm
Rolls per Pallet	18	15	18
Tensile Strength (MD)	1185N/50mm	1185N/50mm	1185N/50mm
Tensile Strength (TD)	1000N/50mm	1000N/50mm	1000N/50mm
Elongation (MD)	30%	30%	30%
Elongation (TD)	30%	30%	30%
Cold Bond	-20°C	-20°C	-20°C

Universal KSK Primer

Container Size	4.5kg
Coverage	100-200g/m^2 depending on substrate absorbency
Flashpoint	Lower than 0^{0}C
Colour	Brown - Dries Black
Shelf Life	12months in original sealed container

Surface Preparation

Ensure the surface is structurally sound, free of surface latence, grease, oil and sharp projections.

Application

Apply by brush or roller ensuring the primer is well applied into the surface. Apply a thin coat and avoid pooling. Allow to dry thoroughly before over coating.

Absorbing substrates (Bitumen, concrete, timber) allowed if:

	Substrate	
Application Temperature	Dry	Damp[1]
> 0^{0}C	Yes	Yes
> 0^{0}C + frost warning	Yes	No
> -10^{0}C	Yes	No

Absorbing substrates (Bitumen, concrete, timber)allowed if:

	Substrate	
Application Temperature	Dry	Damp[1]
> 0°C	Yes	Yes
> 0°C + frost warning	Yes	No
> -10°C	Yes	No

Cleaning

Clean tools with ethyl-acetate or petrol.

Insulation

Thermazone insulation boards, manufactured from CFC/HCFC free Polyisocyanurate must be used below the Icopal Universal® membrane and be laid over a suitable vapour control layer. Insulation thickness must be calculated to meet the latest insulation requirements as detailed in Building Regulation Approved Document L1 and L2. **Contact Icopal Technical Services Department on 0161 865 4444 for details.**

Delivery and Storage

Universal KSK Primer is delivered in sealed containers. Store in closed original containers in a fire proof environment and keep away from open flames and other sources of ignition. In closed original containers Icopal KSK Primer will remain in good condition for at least 12 months.

Thermazone Roofboard

Faced on both sides of the Polyicocyanurate foam with autohesively bonded mineral coated glass tissue is suitable for use with spray bonded waterproofing systems.

Spray bonding to Thermazone Roofboard.

Board Sizes

Flat Board	
Board Size(mm)	2400 x 1200
Board Size)mm)	1200 x 600
Thickness (mm)	25, 30, 40, 50, 60, 80, 90, 100, 110, 120
Thickness (mm)	140 (60mm + 80mm) 200 (100mm + 100mm)

Thermazone Foilboard

Faced on both sides with autohesively bonded low emissivity composite foil. The foil facings are highly resistant to the transmission of water vapour.

150mm overlap onto field areas.

Board Sizes

Flat Board	
Board Size (mm)	2400 x 1200
Thickness (mm)	30, 35, 40, 50, 60, 70, 80, 90, 100, 110, 120

When using Thermazone insulation boards over metal decks attention must be paid to the requirement of the insulation board to comply with the minimum thicknesses shown in the table below.

Trough Width (mm)	Minimum Board
< 75	25
76-100	30
101-125	35
126-150	40
151-175	45
176-200	50

Thermazone Insulation is also available for tapered roof schemes, please contact Icopal Technical Services Department on 0161 865 4444 for details and design service.

Packaging & Storage

The boards are supplied in labelled shrink wrapped packs. The polythene packaging of Thermazone Insulation products should not be considered adequate for long term outdoor protection. Ideally, boards should be stored inside a building. If, however, outside storage cannot be avoided, then the boards should be stacked clear of the ground and covered with a polythene sheet or weatherproof tarpaulin.

Boards that have been allowed to get wet should not be used. For board quantities per pack see tables below.

Flat Board		
Board Thickness (mm)	Pack Size (No. Boards)	
	1200 x 600	2400 x 1200
25	12	12
30	10	10
40	8	8
50	6	6
60	8	5
80	6	4
90	4	3
100	5	3
110	4	3
120	4	2
140	2x60 & 2x80	N/A
200	4x100	N/A

Wind loading and mechanical fixings

Wind Loading

The affect of wind upon a single layer roof covering should be determined at an early stage.

Wind loads are determined by completion of a calculation as recommended in the current edition of BSEN 1991-1-4. The calculation will take the following factors into account:

- Geographical Location (eg, coastal, urban, rural).
- Site topography
- Building height
- Building design
- Large openings
- Method of attachment

Completion of the membrane wind uplift calculation will confirm the fastener centres / spacings for the following roof zones:

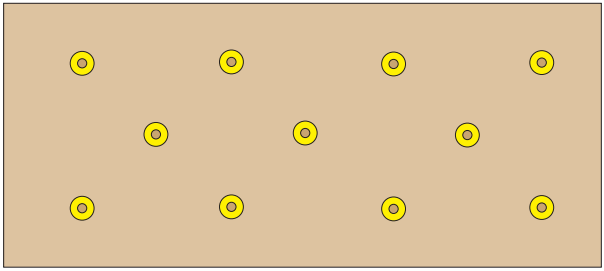
- Corners / Perimeter
- Field Area or central zone
- Width of the perimeter zone

Mechanical Fastening

Regardless of the type of membrane attachment, mechanical fasteners are always required at the roof's perimeter, angle changes and any details. This ensures that any tensions generated in the field membrane are not transferred to other areas.

In warm roofs, the insulation boards may also be mechanically attached. This should always be kept separate from the attachment of the waterproofing membrane.

Icopal recommends that Thermazone Insulation boards should be secured at a rate of 11 fasteners per 2400 x 1200mm (3.8 fixings / m²).



11 No. per board (2.4 x 1.2 m board - 3.81 fixings / m²).

NB Mechanical fixings e.g. telescopic tube fasteners, must be arranged in an even pattern. Fasteners at board edges must be located > 50 mm and < 150 mm from edges and corners of the board and not overlap board joints.

Icopal can provide the required calculations for mechanically fastened systems; please contact Technical Services Department on 0161 865 4444 for further information.

Description

Icopal Universal® membrane and Thermazone insulation should be attached using Icopal Thermally Broken Tubular Washers and Fasteners. The size of washer and fastener is primarily determined by the thickness of insulation and the deck type. For confirmation of the appropriate size of washers and fasteners to use, refer to the reference tables below.

Performance and Properties

Icopal Fastener	Carbon Coated Steel
Compostion	Stainless Steel
Mean Pull Out Value	1.305kN (0.7mm metal) 2.745kN (18mm ply)
Minimum Penetration	20mm (metal) 15mm (ply)

Icopal Tube Fasteners, Plates and Fasteners.

Fastener Guarantees for Timber & Metal

Carbon Coated Steel	Up to 15 years
Stainless Steel	Up to 20 years
Tubular Washer	Timber & Metal - Yellow Concrete – White
Tubular Washer Diameter	50mm

Washer & fastener combinations

Metal Deck Application - Product Name:

Icopal Carbon Steel Fastener

Icopal Stainless Steel Fastener

- Minimum deck penetration to be 20mm.
- 4.8mm fastener diameter.

Icopal Tubular Washers

Insulation Thickness (mm)	Icopal Fastener Length (mm)	Icopal Tubular Washer Length (mm)
60	50	35
70	60	35
80	50	55
90	60	55
100	70	55
110	80	55
120	50	95
130	60	95
140	70	95
150	80	95
160	90	95
170	50	145
180	60	145
190	70	145
200	80	145
210	90	145
220	100	145
230	110	145
240	120	145
250	130	145
260	140	145

Aerated Concrete Deck Application

Icopal Carbon Steel Fastener (Aerated Concrete)

- Minimum deck penetration to be 60mm
- 8.0mm fastener diameter

Icopal Tubular Washers (Concrete)

Insulation Thickness (mm)							
		Icopal tubular Fixing (mm)					
Insulation Thickness (mm)	Icopal Fastener (mm)		35	65	105	165	225
		100	60	90	130	190	250
		120	80	110	150	210	270
		160	120	150	190	250	310
		200	160	190	230	290	350
		240	200	230	270	330	390

Plywood Application

Icopal Carbon Steel Fastener

Icopal Stainless Steel Fastener

- Minimum deck penetration to be 15mm
- 4.8mm fastener diameter

Icopal Tubular Washers

Insulation Thickness (mm)	Icopal Fastener Length (mm)	Icopal Tubular Washer Length (mm)
60	70	35
70	80	35
80	70	55
90	80	55
100	90	55
110	100	55
120	70	95
130	80	95
140	90	95
150	100	95
160	110	95
170	70	145
180	80	145
190	90	145
200	100	145
210	110	145
220	120	145
230	130	145
240	140	145
250	150	145
260	140	145

Dense Concrete Deck Applications

Icopal Carbon Steel Fastener (Aerated Concrete).

Tubular Washer Product Name:

Icopal Tubular Washers (Concrete).

- Minimum deck penetration to be 30mm.
- Pilot hole diameter to be 5mm.
- Drill depth to be 45mm.
- 6.3mm fastener diameter.

Insulation Thickness (mm)							
		Icopal Tubular Washer (mm)					
Insulation Thickness (mm)	Icopal Fastener (mm)		50	90	150	210	225
		50	80	120	180	240	210
		60	90	130	190	250	240
		70	100	140	200	260	250
		90	120	160	220	280	260
		110	140	180	240	300	280
		130	160	200	260	320	300
		170	200	240	300	360	320
		210	240	280	340	400	360
		220	210	240	280	340	400

Xtra-Seal Membrane Spray Adhesive

Adhesive

Xtra-Seal Membrane Spray Adhesive is a versatile, high performance industrial contact adhesive designed for use with Icopal Universal® membranes. The adhesive is water resistant and offers instant adhesion between the membrane and substrate.

Xtra-Seal membrane Spray Equipment.

1. Xtra-Seal Membrane Spray Adhesive 13.5 kg Cannister.
2. Spray Hoses.
3. Cleaner Cannister.
4. Cleaner Aerosol.
5. Pressure Rollers.
6. Adjustable Spray Nozzle.
7. Economy Spray Nozzle.
8. Spray Nozzle & Extension.

Colour	Green
% solids	28 – 33%
Specific Gravity	0.68 to .72 gm/cc
Solvent Type	Hexane / Acetone
Shelf Life	12 months
Canister Size / Weight	13.6kg
Coverage (subject to surface)	70 – 100m²

Delivery and Storage

The product will not be damaged by freezing, however it should be returned to room temperature prior to use. For canister products, keep cylinders off floor when the temperature is below 16°C.

Disposal

- Invert canister.
- Point nozzle away from operator and carefully open valve to evacuate the canister of any residual pressure.
- Identify the puncture bung in the top of canister.
- Pierce or remove the pressure relief bung using a brass punch.
- Dispose in suitable waste unit.

Cleaner

Xtra-Seal B Safe Cleaner is an environmentally friendly, biodegradable cleaner, derived from soybean extract. 100% organic, the cleaner contains no water, terpenes or citrus oil. The cleaner is available in a 4kg canister for flushing equipment and hoses and a 0.4kg aerosol for general cleaning and removing spillages.

Uses

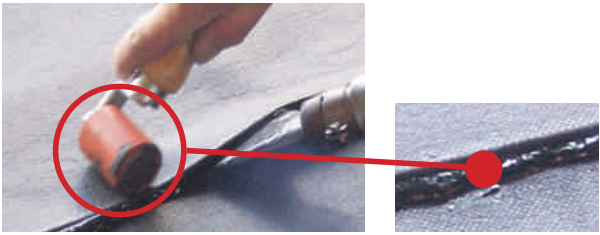
Used to clean existing spray equipment and to remove adhesive spillages from a variety of surfaces.

% VOC	0%
Specific Gravity	0.85 to .90 gm/cc
Solvent Type	d-limonene
Shelf Life	12 months
Aerosol Size	0.4kg
Canister Size	4kg

Membrane application

End/Head Laps

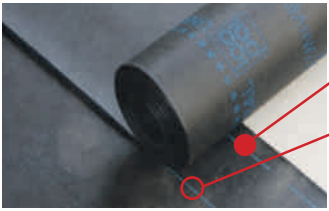
All end/head laps must be overlapped a minimum of 130mm and sealed using hot air welding equipment, ensuring a continuous 5mm bead of bitumen extrudes from the lap joint as work proceeds. All lap joints must be checked for security as work proceeds.



5mm continuous bead extruding from overlap.

Side Laps

All side laps must follow the printed selvedge line on the upper surface of the membrane and must be a minimum of 130mm and sealed using hot air welding equipment, ensuring a continuous 5mm bead of bitumen extrudes from the lap joint as work proceeds. All lap joints must be checked for security as work proceeds.



Mechanical Fixing line.

Overlap line.

Overlaps of details onto field areas

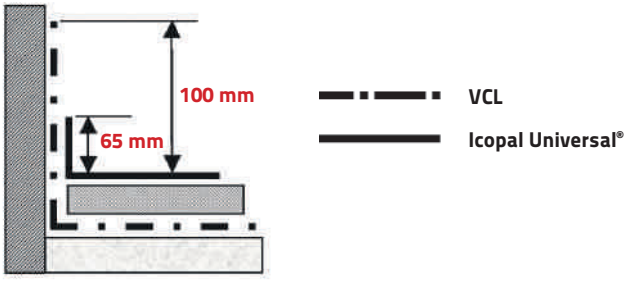
All laps of detail sheets onto field area membrane must be a minimum of 150mm and sealed using hot air welding equipment, ensuring a continuous 5mm bead of bitumen extrudes from the lap joint as work proceeds. All lap joints must be checked for security as work proceeds.

150mm overlap onto field areas.

Enveloping Insulation

To ensure the insulation is completely enveloped the Vapour Control Layer (VCL) should be turned up all upstands and projections to terminate a minimum of 100mm above the finished level of the applied insulation.

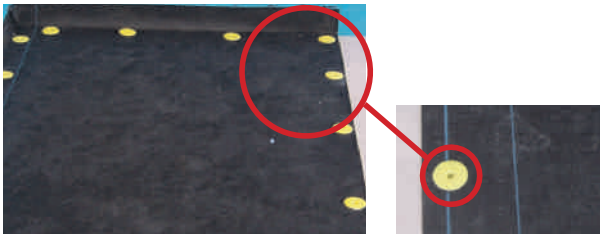
The field area Universal membrane is turned up 65mm and heat welded to the VCL; enveloping the insulation and creating a temporary overnight seal at perimeters etc.



Enveloping Insulation with Universal & VCL.

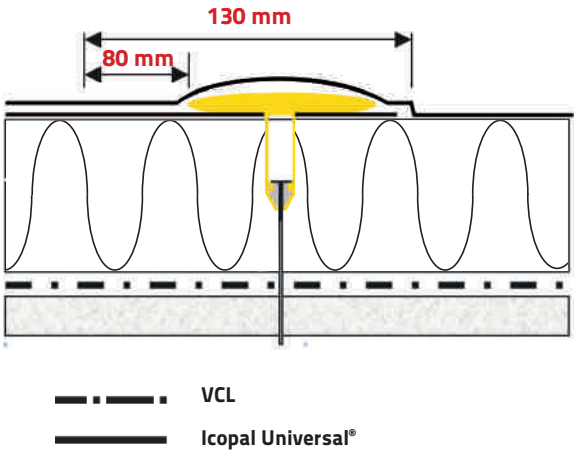
Mechanical Fixing

Mechanical fixed systems must be attached to through the insulation to the structural substrate using Icopal Tube fasteners and fixings. The fixing pattern must follow the recommended centres for both the field zone and perimeter/corner zones as detailed in the Icopal Fixing calculation plan.



Mechanical fixings to field & perimeter zones.

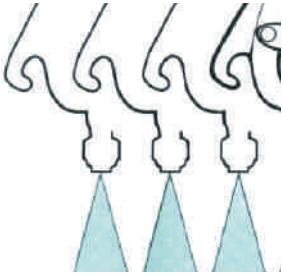
The overlap must be welded a minimum of 80mm beyond the extent of the fastener head.



Spray Bonding

1. Prepare the surface to be bonded; ensuring both faces are clean, free of dust, dirt and grease.

2. Hold spray gun at a constant distance of between 100-225mm from the surface, allowing the adhesive to cobweb across the surface with minimal overlap (note - correct coat weight must be achieved).

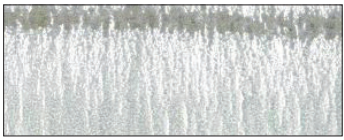


Correct - Keep spray head 90^0 to surface.

Wrong – Do not tilt Spray Head.

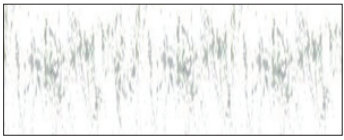
3. Maintain a constant speed of application during spraying, applying a consistent and thorough coating without allowing the adhesive to puddle or heavily 'wet' the surface. Maximum bond strength is achieved with coverage of between 80-100%, and a recommended minimum coat weight of 20 dry grams per square metre.

Guide to spray coverage



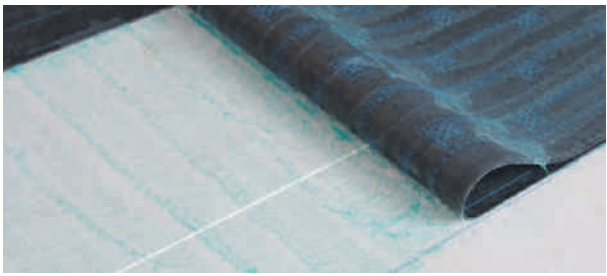
Coverage too Heavy.

Coverage too Light.



Correct Coverage.

4. Maximum adhesion will be obtained by spraying mating faces at 90° to each other, i.e. one face vertically, the other face horizontally.
   Double coating perimeter of face and edges is recommended, including areas around subsequent cutting positions.



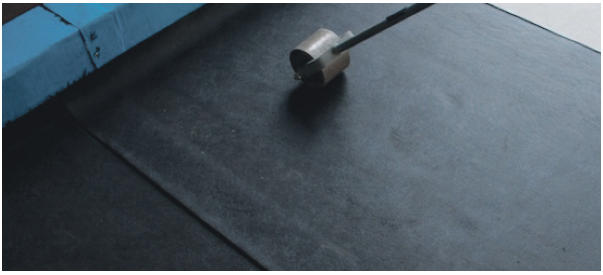
Mating faces sprayed at 90º to each other.

5. Do not angle spray gun or move in an arc while spraying. Hold gun at 90° to surface while spraying. Release the trigger at the end of each pass to optimize coverage (see illustrations on previous page)

6. Best results are obtained by multiple coats rather than one heavy coat which may result in heavy wetting of surface and extended drying times. Always test before using in production.

7. Allow adhesive to dry. Test for dryness using back of finger only. Surface should be tacky but adhesive should not transfer to skin. Position substrates correctly and press together working from the centre outwards. Apply adequate pressure using weighted rollers, in order to achieve at least 35 psi at glue line.

Note that repositioning is not possible after contact has been made.



Roll bonded areas with weighted roller.

8. Immediate trimming is possible. Full strength is achieved after 24-48 hours depending on temperature and humidity.

Special Precautions

For best results store canister above 18°C during use. Allow substrates to acclimatize to ambient temperature (18°C) for 48 hours before bonding.

Do not exceed open time of adhesive.

Keep canister off cold concrete floors during use.

If adhesive is expelled wet or as a jet, canister is too cold — move to a warm environment and allow to thoroughly acclimatise before reusing.

Caution

- Do not thin or reactivate with solvents.
- Do not puncture or incinerate canister.
- Do not expose to extreme heat.
- Keep away from sources of ignition.
- Local exhaust ventilation may be required.
- Release pressure before disconnecting hose.
- Test for suitability before use.
- MSDS and technical data sheets must be read and understood before use.

Cleaning

Xtra-Seal B Safe Cleaner

Xtra-Seal B Safe Cleaner is an environmentally friendly, biodegradable cleaner, derived from soybean extract. 100% organic, the cleaner contains no water, terpenes or citrus oil. The cleaner is available in a 4kg canister for flushing equipment and hoses and a 0.4kg aerosol for general cleaning and removing spillages.

Xtra-Seal B Safe Cleaner.

Application - Aerosol

Shake can well before using.

Spray approximately 150-200mm from surface. Allow cleaner to remain on surface for a few seconds then using a clean cloth, wipe off adhesive.

Wipe thoroughly to obtain a residue free clean surface. For very obstinate adhesive, allow cleaner to come in contact with adhesive for longer time before wiping, or successive applications may be required.

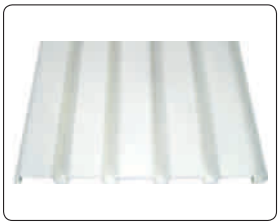
Make sure that the surface is thoroughly dry before applying new adhesive.

Application - Canister

To clear and flush through pipes and spray nozzles, disconnect from spray canister and connect to the 4kg B Safe Cleaner canister and flush through until the exhaust spray runs clear. Turn off canister and disconnect.

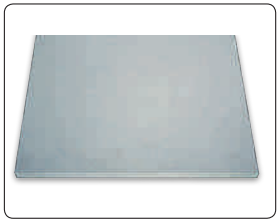
Suitable Substrates

Profiled Metal Decking



A profile metal deck does not provide a continuous supporting upper surface for the direct application of the waterproofing system, therefore the crowns should comprise approximately 50% of the total area. Profiled metal decking should be manufactured either in galvanised steel to BS EN 10147:2000 or in aluminium to BS EN 485-2:1995. All profiled metal decking must be installed in accordance with the manufacturers instructions.

Concrete



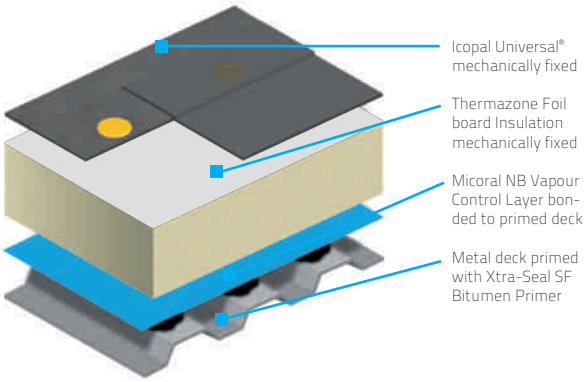
Concrete decking can include both insitu and pre-cast concrete, and all flush finish cementitious screeds. Concrete decks should be finished with a wood float to provide a suitably smooth surface free from ridges and hollows. In order to ensure a good degree of bonding of the waterproofing new concrete or screeded decks must be given adequate time to dry out, prior to installing the waterproofing system.

Plywood/OSB 3

Plywood should comply with BS EN 636:2003 clause 8 regarding exterior use. For roofs with joist spacings of up to 450mm a minimum thickness of 15mm may be used and for joist spacings of up to 600mm a minimum thickness of 18mm should be used.
Any preservative treatments used on the plywood must be compatible with the waterproofing system.

Oriented Strand Board (OSB) must be type OSB/3 or OSB/4 conforming to BS EN 300:1997.
Boards must be protected from rain/water and remain dry.
For roofs with joist spacings of up to 450mm a minimum thickness of 15mm may be used and for joist spacings of up to 600mm a minimum thickness of 18mm should be used.

Single layer
mechnically fixed


Icopal Universal® mechanically fixed
Thermazone Foil board Insulation mechanically fixed
Micoral NB Vapour Control Layer bonded to primed deck
Metal deck primed with Xtra-Seal SF Bitumen Primer

Vapour Control Layer

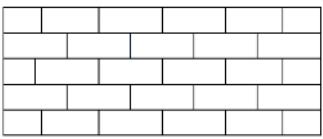
Roll Size: 1.08m x 50m

Apply Micoral NB Heat Activated Self Adhesive VCL bonded to primed substrate with 75mm side laps and 100mm end laps sealed. The VCL must be dressed at all details to a minimum of 100mm above finished insulation level to allow encapsulation of insulation.

Insulation

Board Size: 2400mm x 1200mm

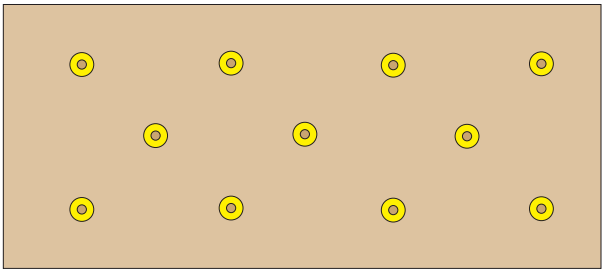
Apply Thermazone Foilboard to VCL in half board pattern, mechanically fixed.



Insulation Boards Laid Half Board Pattern.

Roof covering

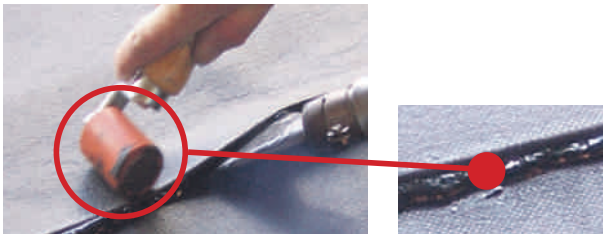
Install Icopal Universal® mechanically fixed in the longitudinal overlap (width 130mm) with Icopal tube fasteners and fixings, frequency of fixings is determined by calculation in accordance with the current edition of BSEN 1991-1-4.



1200 x 2400 board. Insulation 11 fixings per 1200mm x 2400mm board.

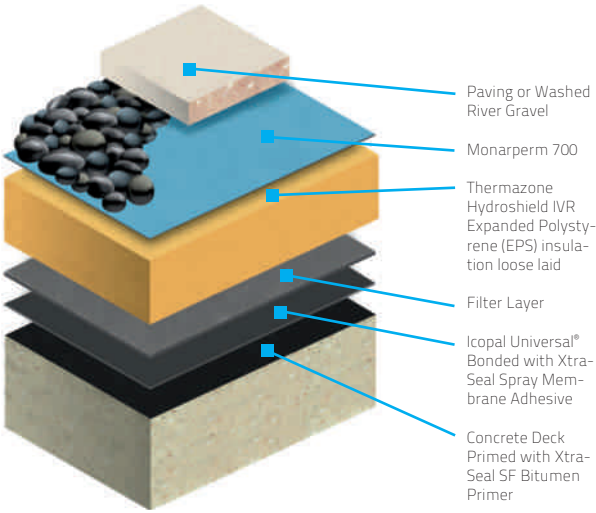
Icopal Universal® must be dressed to all upstands a minimum of 65mm and bonded to the vapour control layer, enveloping the insulation and creating a temporary seal/night joint leaving approximately 35mm of the vapour control layer exposed for inspection until detailing can be completed.

Weld all overlaps as work proceeds with an Icopal-approved hot air welder; sidelaps 130mm minimum and end/head laps 150mm minimum. overlap 150mm. Ensure a continuous bead of bitumen extrudes fro all laps as work proceeds. All laps must be checked for security as work proceeds.



5mm Bitumen Bead.

Single layer ballasted "inverted roof"


Paving or Washed River Gravel
Monarperm 700
Thermazone Hydroshield IVR Expanded Polystyrene (EPS) insulation loose laid
Filter Layer
Icopal Universal® Bonded with Xtra-Seal Spray Membrane Adhesive
Concrete Deck Primed with Xtra-Seal SF Bitumen Primer

Roof covering

Icopal Universal® with sidelap (width 130mm) bonded to substate with Xtra-Seal membrane Spray Adhesive. Icopal Universal® must be dressed to all upstands a minimum 65mm and bonded to create a temporary seal/night joint until detailing can be completed. Weld all overlaps as work proceeds with an Icopal-approved hot air welder; sidelaps minimum 130mm and end/head laps overlap 130mm minimum.

Insulation

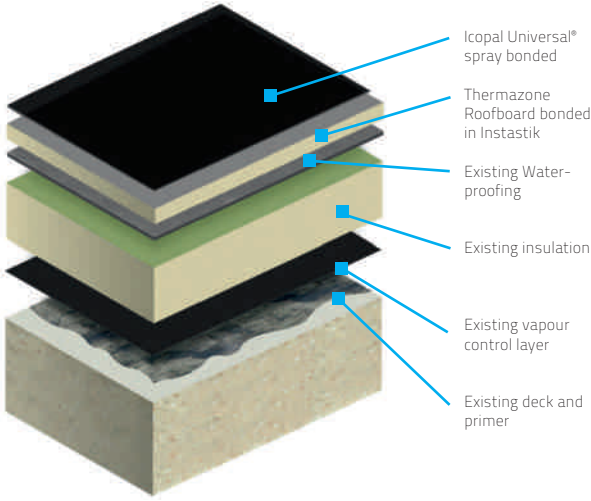
Loose lay Thermazone Hydroshield IVR Expanded Polystyrene (EPS) insulation over Icopal Universal®. A filter layer must be installed between the Icopal Universal® and the insulation.

Ballast layer

Apply a layer of Monarperm 700 breather membrane loose laid over the insulation to act as a filter layer and increase the minimum lambda value of the insulation.

Apply a minimum 50mm deep layer of washed river gravel or 50mm thick concrete paving slabs.

Single layer spray bonded overlay to existing waterproofing



Pre-treatment

Ensure the existing waterproofing is well bonded to the roof substrate. Make necessary repairs to blisters and splits in existing system.

Roof covering

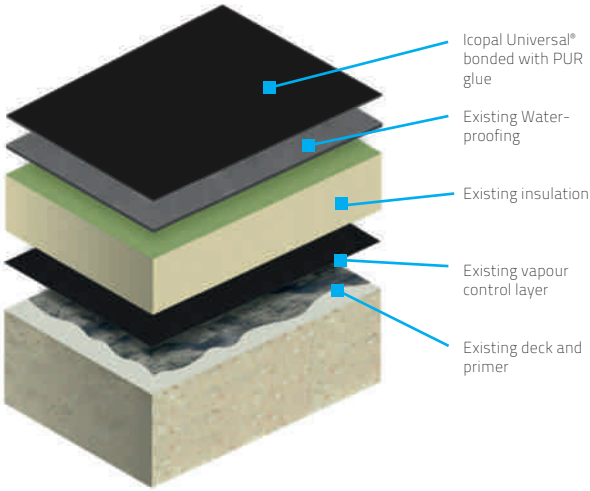
Clean and repair existing roof waterproofing as required ensuring all blisters and splits are cut and re-sealed. Prime existing waterproofing with Xtra-Seal QD Bitumen Primer in accordance with the application instructions on the container and allow to dry thoroughly.

Install Icopal Thermazone Roofboard (25mm) bonded in Instastik Insulation Adhesive in accordance with manufacturers instructions. Install Icopal Universal® spay bonded with Xtra-Seal Spray membrane adhesive with 130mm side and end/head laps sealed by heat welding.

Icopal Universal® must be dressed and bonded to all upstands a minimum 65mm above finished height of insulation and bonded to create a temporary seal/night joint until detailing can be completed.

Weld all overlaps as work proceeds with an Icopal-approved hot air welder; sidelaps 130mm and transverse overlap 150mm.

Single layer overlay bonded to existing waterproofing



Pre-treatment

Ensure the existing waterproofing is well bonded to the roof substrate. Make necessary repairs to blisters and splits in existing system.

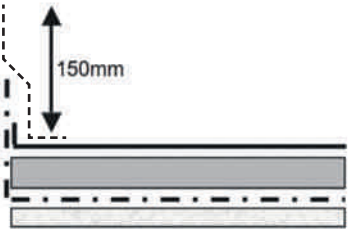
roof covering

Install Icopal Universal® bonded with Icopal PUR adhesive allowing a minimum of of 4 stripes of adhesive per 1m width of membrane and ensure the 130mm side and end/head laps to are remain open to be sealed by heat welding. Icopal Universal® must be dressed and bonded to all upstands a minimum 65mm and bonded to create a temporary seal/night joint until detailing can be completed. Weld all overlaps as work proceeds with an Icopal-approved hot air welder; sidelaps 130mm and transverse overlap 150mm.

Detailing

Upstand to Warm Roof

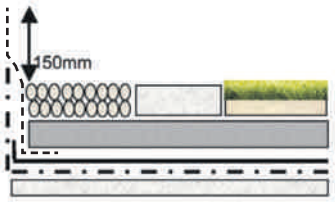
All details must be terminated a minimum of 150mm above the finished roof level including any surface finishes.



150mm upstand height warm roof.

Upstand to Inverted/Green Roof

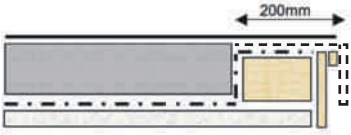
For inverted and green roofs measure the height of the detail from the finished level of the added paving or ballast.



150mm upstand height inverted or green roof.

Welted Drip Trim

At the edges of added insulation a timber hard edge must be provided. The timber edge should be 150mm wide and the thickness should be 10mm thinner than the thickness of the insulation to avoid a water check when membranes are



Hard edge 10mm thinner than insulation.

Key

VCL

Icopal Universal®

Icopal Universal® SA

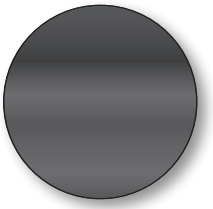
Universal® SA heat activated detail membrane is used on all detail works and must be dressed onto the field area membrane a minimum of 150mm and heat welded to the field membrane using hot air equipment and ensuring a continuous 5mm bead of bitumen extrudes from all overlaps as work proceeds.

For more comprehensive detail drawings see pages 55-62 or contact Icopal Technical Services on 0161 865 4444.

Corners

All corners must be reinforced with Icopal Universal® Internal/ External reinforcing pieces

Universal® Internal Reinforcement.



Universal® Internal/External Reinforcement.

Application of lower internal corner reinforcement.

Stage 1.
Locate reinforcement centrally over corner.

Stage 2.
Warm and mould disc into corner.

Stage 3.
Weld base of disc to field membrane.

Stage 4.
Weld sides of disc into corner.

Stage 5.
completed corner reinforcement.

Application of Universal® upper internal corner reinforcement

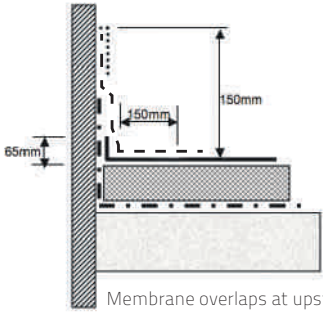
Stage 1.
Locate reinforcement centrally over corner.

Stage 2.
Weld upper portion into place.

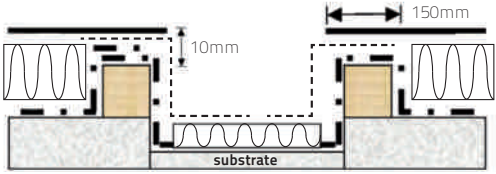
Stage 3.
Secure with roller.

Stage 4.
Weld lower flanges.

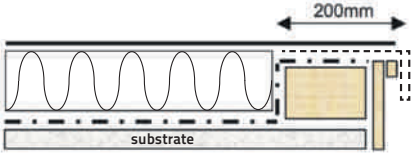
Stage 5.
Completed corner reinforcement.



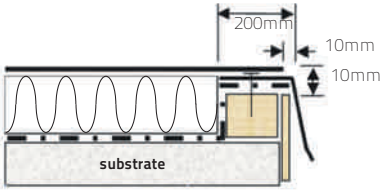
Membrane overlaps at upstand.



Membrane overlaps in box gutter.



Membrane overlaps at welted drip.



Roof Edge Drip Trim detail.

Key

VCL

Icopal Universal®

Icopal Universal® SA

Installation of Universal® POCB Parapet Outlet.

Stage 1.
Install field area and upstand waterproofing as before and cut around opening for outlet ensure all edges are well sealed.

Stage 2.
Offer up pre-fabricated Universal® POCB Parapet outlet ensuring bent flange sits securely into base of upstand.

Stage 3.
Weld Parapet outlet flange to main waterproofing membrane ensuring a 5mm bead of bitumen extrudes around the complete flange edge.

Stage 4.
Weld base of flange to field area ensuring a secure bond across overlap of flashing to field area.

Stage 5.
Finished outlet. Ensure a parapet outlet leaf grate is properly secured.
Outlet can be recessed into a sump if required

Installation of Universal® POCB Roof Outlet

Stage 1.
Install field area waterproofing as before and cut around opening for outlet ensure all edges are well sealed.

Stage 2.
Offer up pre-fabricated Universal® POCB Roof outlet ensuring flange sits securely onto field area membrane

Stage 3.
Weld flange over full area ensuring a full bond to field area membrane

Stage 4.
Finish welding around full perimeter of outlet flange ensuring a 5mm bead of bitumen around the flange edge.

Stage 5.
Finished outlet. Ensure a roof outlet leaf grate is properly secured.
Outlet can be recessed into a sump if required.

Installation of Universal® Telescopic Vent Pipe

Stage 1.
Install Field area membrane around pipe penetration.

Stage 2.
Offer up pre-fabricated Universal® POCB upstand pipe and flange.

Stage 3.
Ensure flange sits tight to field area membrane.

Stage 4.
Fully bond flange to field area membrane ensuring a 5mm bead of bitumen extrudes from the flange edge.

Stage 5.
Finished Vent Pipe. Ensure all "O" rings are properly located and cowl is secured by self taping screws.

Installation of Universal® Cable & Pipe Duct

Stage 1.
Install field area membrane around pipe penetration.

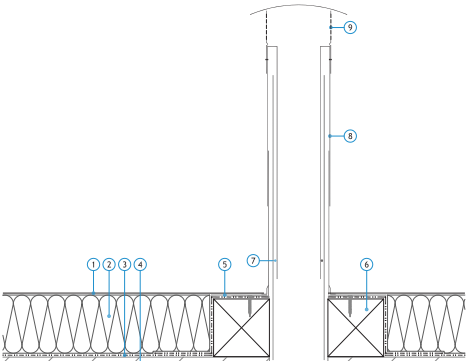
Stage 2.
Offer up prefabricated Universal® POCB Cable and Pipe Duct.

Stage 3.
Ensure flange sits tight to field area and bond POCB Flange to field area

Stage 4.
Fully bond flange to field area membrane ensuring a 5mm bead of bitumen extrudes from the flange edge

Stage 5.
Finished Cable and Pipe Duct. Ensure plastic elbows are secured to the metal upstand pipe and the red plastic bung is secured in the plastic elbow to prevent the ingress of insects etc.

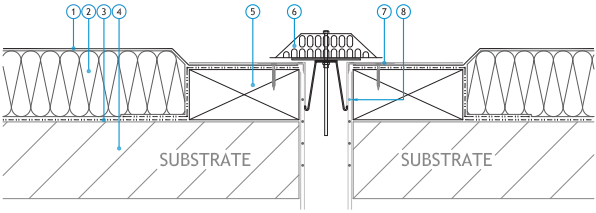
Standard CAD **Details**



The following standard CAD details and others are available from Icopal Technical Services.

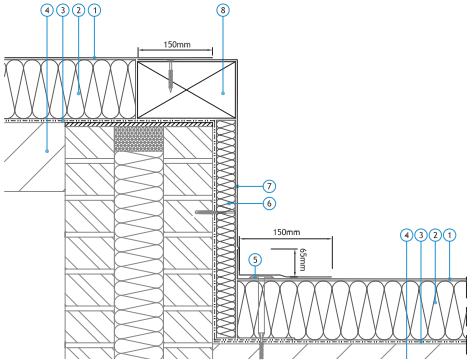
Universal® POCB Telescopic Vent

1. Icopal Universal® bitumen single layer membrane.
2. Thermazone Roofboard insulation, mechanically fastened.
3. Micoral NB Vapour Control Layer.
4. Substrate, prepared in accordance with current instructions.
5. Roofguard Telescopic Vent, with Icopal Universal® POCB bitumen flange.
6. Timber batten.
7. Compressible rubber 'O' ring seal.
8. Telescopic Double Pipe.
9. Vented Cowl, secured with self-tapping screws.



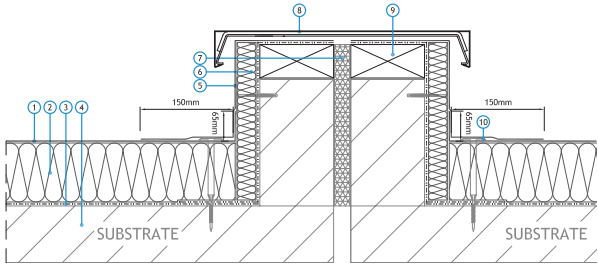
Warm Roof with Universal POCB Outlet

1. Icopal Universal® bitumen single layer membrane.
2. Thermazone Roofboard insulation, mechanically fastened.
3. Micoral NB Vapour Control Layer.
4. Substrate, prepared in accordance with current instructions.
5. Timber hard edge.
6. Roofgard Leaf Grate, secured with expanding 'A' clamp.
7. Roofgard Outlet with Icopal Universal® POCB bitumen flange, installed over main waterproofing.
8. Compressible rubber 'O' rings to seal downpipe.



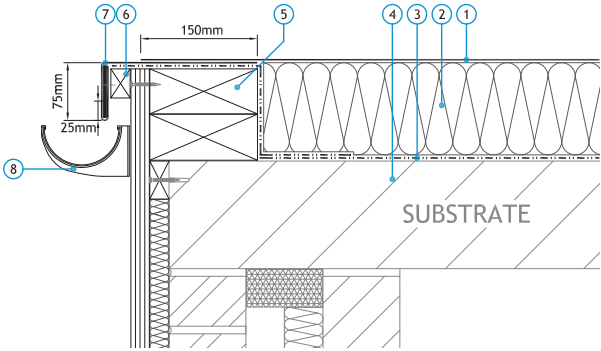
Warm Roof Change of Level

1. Icopal Universal® bitumen single layer membrane.
2. Thermazone Roofboard insulation.
3. Micoral NB Vapour Control Layer.
4. Substrate, prepared in accordance with current instructions.
5. Icopal Tubular Washer and mechanical fixings.
6. Thermazone Roofboard insulation, to upstand.
7. Icopal Universal® SA, at details.
8. Treated timber edge batten, securely fixed to substrate.



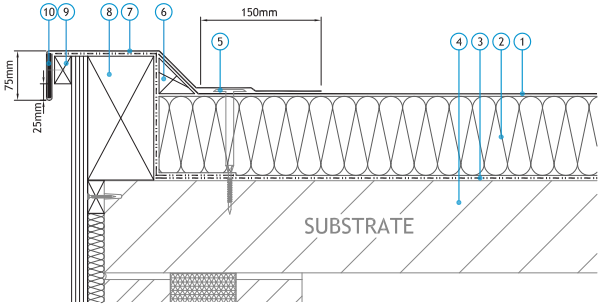
Warm Roof Expansion Joint with Pre-formed Metal capping

1. Icopal Universal® bitumen single layer membrane.
2. Thermazone Roofboard insulation, mechanically fastened.
3. Micoral NB Vapour Control Layer.
4. Substrate, prepared in accordance with current instructions.
5. Icopal Universal® SA, at details.
6. Thermazone Roofboard insulation, at details.
7. Non-flammable compressible insulation.
8. Preformed metal capping, by others. Consult relevant manufacturer for fixing instructions.
9. Timber batten.
10. Icopal Tubular Washer and mechanical fasteners.



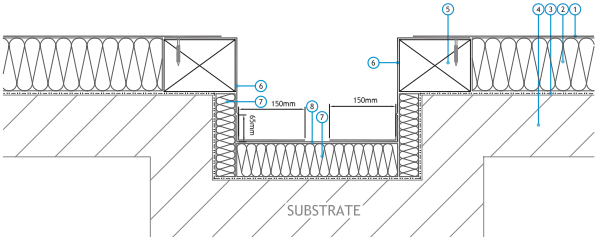
Warm Roof Eaves Detail with Welted Drip

1. Icopal Universal® bitumen single layer membrane.
2. Thermazone Roofboard insulation.
3. Micoral NB Vapour Control Layer.
4. Substrate, prepared in accordance with current instructions.
5. Timber hard edge (10mm thinner than insulation thickness).
6. Drip batten.
7. Icopal Universal® SA, as welted drip reinforced with hardboard former.
8. External rainwater gutter.



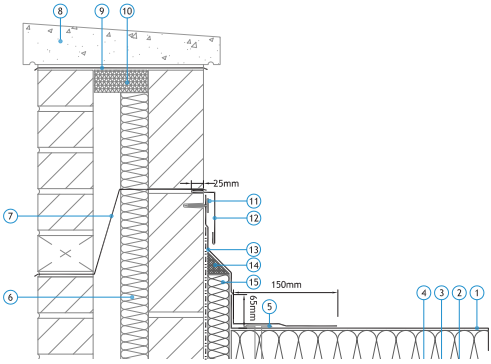
Warm Roof Water Check with welted Drip

1. Icopal Universal® bitumen single layer membrane.
2. Thermazone Roofboard insulation.
3. Micoral NB Vapour Control Layer.
4. Substrate, prepared in accordance with current instructions.
5. Icopal Tubular Washer and mechanical fixings.
6. Timber fillet.
7. Icopal Universal® SA, at detail.
8. Timber hard edge.
9. Drip batten.
10. Icopal Universal® SA, as welted drip reinforced with hardboard former.
11. Angle fillet.



Warm Roof to Internal Box Gutter

1. Icopal Universal® bitumen single layer membrane.
2. Thermazone Roofboard insulation mechanically fastened.
3. Micoral NB Vapour Control Layer.
4. Substrate, prepared in accordancce with current instructions.
5. Icopal Universal® SA, at details.
6. Thermazone Roofboard insulation, at details.
7. Non-flammable compressible insulation.
8. Icopal Universal® bitumen single layer membrane, to gutter sole.



Warm Roof Upstand to Parapet wall with Coping

1. Icopal Universal® bitumen single layer membrane.
2. Thermazone Roofboard insulation.
3. Micoral NB Vapour Control Layer.
4. Substrate, prepared in accordance with current instructions.
5. Icopal Tubular Washer and mechanical fixings.
6. Cavity insulation, by others.
7. Cavity tray by others. Ensure cavity tray cavity tray is postioned above cover flashing.
8. Coping Stone.
9. Damp Proof course.
10. Non-flammable compressible insulation.
11. Mechanical fixing with Terminaton Bar.
12. FormFlash cover flashing securely wedged with FormFlash Clips 350mm centres and pointed with suitable sealant.
13. Icopal Universal® SA, at details.
14. Angle fillet.
15. Thermazone Roofboard insulation, at details.

Accessories

Icopal Universal® POCB Lightning Conductor Pads

Product Code 3007327 Coated
Product Code 3007328 Bare

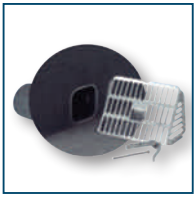
Icopal Universal® POCB Cable & Pipe Duct

Product Code 3007329

Roofgard Icopal Universal® POCB Parapet Outlet with Leaf Grate

Product Code 3007330 100mm Outlet
Product Code 3005279 Parapet Outlet Leaf Grate
Product Code 3007359 Parapet Outlet with Leaf Grate

Roogard Icopal Universal® POCB Outlet with Turbo Leaf Grate/Universal® Leaf Grate



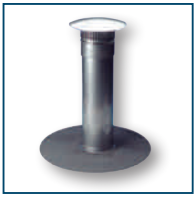
Universal® Leaf Grate

Product Code	3007345	50mm
Product Code	3007346	62mm
Product Code	3007347	80mm
Product Code	3007348	90mm
Product Code	3007349	95mm
Product Code	3007350	145mm

Universal® Turbo Leaf Grate

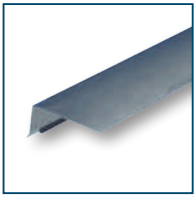
Product Code	3007351	50mm
Product Code	3007352	62mm
Product Code	3007353	80mm
Product Code	3007354	90mm
Product Code	3007355	95mm
Product Code	3007356	145mm

Icopal Universal® Cowled Telescopic Vent



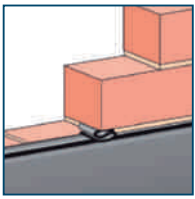
Product Code 3007331

SafeSeal Drip Trim



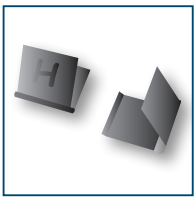
Product Code 3005227

FormFlash Lead Free Flashing



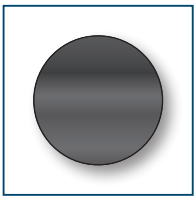
Product Code	2003728 120mm
Product Code	2003730 150mm
Product Code	2003731 200mm
Product Code	2003732 250mm
Product Code	2003733 300mm
Product Code	2003734 450mm
Product Code	2003735 650mm
Product Code	3005926 950 mm

FormFlash fixing Clips



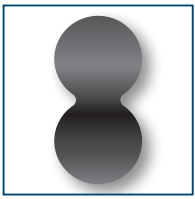
Product Code	3006140 FormFlash Fixing Clip- pack 25 clips

Icopal Universal® External Corner Reinforcement



Product Code	3007339

Icopal Universal® Internal Corner Reinforcement



Product Code	3007340

Icopal Universal® – A perfect combination

Icopal Universal® can be applied as a substrate for the Eco-Activ® system ICOSUN®.

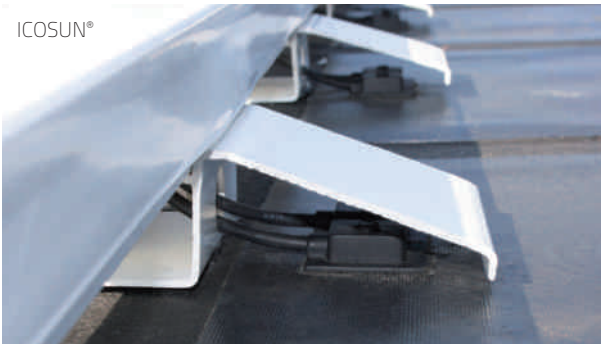
Eco-Activ®

Icopal invests in many sustainable roof developments. The products that result from these investments are marketed under the name Eco-Activ®. By applying the innovative Eco-Activ® systems, each m² of roofing surface acquires an additional function, which ensures that roofs make a positive contribution to environmental and climate issues.

ICOSUN®

By using flexible solar cells, sunlight is converted directly into electricity. This generated electric energy can be supplied to a battery or the grid. That is good for the environment and the roof returns the investment.

ICOSUN®



Notes

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